VASOMOTOR RESPONSE OF INTERNAL MAMMARY ARTERY AND SAPHENOUS VEIN BYPASS GRAFTS TO INCREASES IN HEART RATE

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Increasing blood flow results in endothelium-dependent vasodilation of angiographically normal epicardial coronary arteries in humans. To compare the ability of internal mammary artery (IMA) and saphenous vein (SV) used as coronary artery bypass grafts to adapt their vasomotor tone to an increase in myocardial blood flow demand induced by tachycardia, 10 IMA and 6 SV grafts were studied by quantitative angiography more than 6 months (range: 6 to 82 months) after surgery in 16 patients. All grafts were angiographically smooth and implanted to large non-akinetic perfusion zones. Angiograms were obtained in basal sinus rhythm (71±10 beats/min), during atrial pacing (129±9 beats/min) and after intragraft infusion of 1 mg of isosorbide dinitrate (ISDN). In basal sinus rhythm, the cross-sectional area of SV was superior to that of IMA (11.3±3.4 vs 5.4±1.7 mm^2; p<0.01). All IMA vasodilated during pacing (+14.8±11.5%; p<0.005) and a further increase in IMA cross-sectional area occurred after ISDN (+27.4±20.4% vs basal; p<0.005). In contrast, SV failed to dilate during pacing (-0.3±5.6%; NS) and after ISDN (-0.1±6.2% vs basal; NS). Thus, an increase in myocardial blood flow demand induced by tachycardia results in vasodilation of IMA but not of SV grafted on coronary vessels. The ability of the endothelium to modulate the vasomotor tone of IMA grafts in response to changes in blood flow could contribute to their excellent long-term functional results after coronary artery bypass surgery.

TRANSESOPHAGEAL DOPPLER ASSESSMENT OF REVERSIBLE MYOCARDIAL DIASTOLIC DYSFUNCTION AFTER SUCCESSFUL CORONARY BYPASS SURGERY

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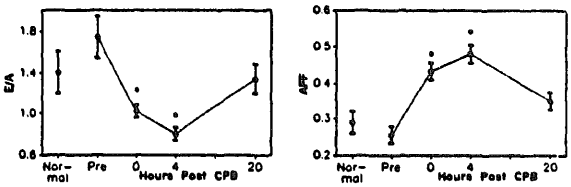
The immediate effects of cardiopulmonary bypass (CPB) on LV diastolic function after coronary bypass surgery have not been well characterized. Accordingly, transesophageal echo (TEE) pulsed Doppler was used to assess mitral inflow patterns as indices of diastolic function on 11 consecutive patients, aged 55±16 yrs, who underwent successful coronary bypass surgery. E to A velocity ratios (E/A) and atrial filling fractions (AFF) were measured by TEE Doppler pre-CPB, immediately post-CPB, 4 hr post-CPB, and 20 hr post-CPB. Left atrial pressure was directly measured and was controlled for each study period (10±3 mmHg). E/A and AFF values from 18 normal subjects of similar age were used for comparison. Results are mean ± S.E. (* p<0.01 vs. Normal and pre-CPB).



E/A and AFF as Doppler indices of diastolic function were abnormal immediately post-CPB and at 4 hr post-CPB. These indices returned to normal by 20 hr post-CPB. Therefore, TEE Doppler indices indicate reversible myocardial diastolic dysfunction after CPB in patients who have undergone successful coronary bypass surgery.

ARE PATIENTS WITH A HISTORY OF RECENT MYOCARDIAL INFARCTION AT HIGHER RISK FOR COMPLICATIONS DURING CORONARY BYPASS SURGERY?

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To assess the effect of the recency of myocardial infarction (MI) on surgical outcome, 793 consecutive patients with MI who had coronary bypass surgery (CABG) were reviewed. Patients were divided into 2 groups: I - recent MI (< 7 days previously) (N=102); and II - remote MI (N=691). These groups did not differ in age, sex, presence of unstable angina, extent of coronary disease, incidence of left main stenosis, left ventricular function, or surgical conduit (mammary vs. vein graft) used. Group I patients had more frequent use of the intra-aortic balloon counterpulsation (IABP) preoperatively compared to group II (6.9 vs 2.7%; p<.05). Morbidity and mortality was compared between the groups:

	I (%)	II (%)	p-value
Death	2.0	2.6	n.s.
Q-wave MI	1.0	1.9	n.s.
Reexploration	4.9	4.6	n.s.
Wound Infection	2.0	2.7	n.s.
Stroke	2.9	1.7	n.s.
Event Free	80	81	n.s.

Conclusion: patients undergoing CABG after recent MI do not appear to be at higher risk for complications compared to patients whose MI is more remote in time.

PATHOPHYSIOLOGY OF CORONARY SINUS LIGATION: EVIDENCE FOR THE DEVELOPMENT OF VENOUS COLLATERALS

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Injury caused by coronary sinus interventions may be treated by ligation of the coronary sinus (CSL) because it is assumed the presence of venous collaterals and thebesian drainage would immediately accommodate coronary sinus flow. However in the pig, 1. Proximal (ostial) CSL results in death with 2 hours. 2. Distal (great cardiac vein) CSL results in mild heart dysfunction but long-term survival. We postulated distal CSL would promote the development of functional venous collaterals, thus making secondary proximal CSL feasible. Twelve pigs survived proximal CSL, 2 weeks after distal CSL. Myocardial function was assessed using hemodynamics, including CS pressure, and sonomicrometric wall motion on short and long-term.

After distal CSL the CS pressure increased associated with myocardial dysfunction: decreased LV stoke work and LV dilatation. The subsequent proximal CSL did not result in myocardial dysfunction. The elevated CSP seen after distal CSL had returned to and stayed normal.

We conclude venous collaterals develop over time in response to distal CSL thus making proximal CSL tolerable.